Minuteman Missile National Historic Site: Protecting a Legacy of the Cold War


(National Park Service)

"The Minuteman was one of the most significant strategic weapons in U.S. history. With the turn of a key, the missile could deliver its nuclear weapon to a Soviet target in 30 minutes or less. It was a weapon for which there was virtually no defense – for a war no one could win. For nearly three decades Ellsworth's 44th Missile Wing stood on alert. Then in 1989 the Berlin Wall fell."[1]

Dispersed across the rolling high plains of Western South Dakota during the Cold War were one hundred and fifty Minuteman Missiles. These missiles held warheads which could have been used in a devastating counter strike against the Soviet Union in the event of a nuclear war. The industrial might and mechanistic strength held within the silos was in stark contrast to their rural location in the midst of golden wheat fields and pastoral grazing lands.

For three decades – 1963-1993 – thousands of people passed through this seemingly peaceful area unaware of the destructive force hidden beneath the landscape. The Minuteman system transformed the prairie into a military and technological frontier. As the first solid-fuelled Intercontinental Ballistic Missile ever deployed by the United States, the Minuteman enhanced America's military capabilities. It was a key component of America's Cold War policy of deterrence and by extension helped America gain eventual victory in the Cold War. Designated in 1999, Minuteman Missile National Historic Site protects and preserves cultural resources from the Cold War.

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[1] *Testimony of Tim J. Pavek, Minuteman II Deactivation Program Manager, U.S., Congress, House of Representatives, Hearings before the Subcommittee on National Parks and Public Lands House Committee on Resources, 106th Congress, September 14, 1999.*

Teaching With Historic Places – Minuteman Missile National Historic Site

Getting Started: Inquiry Question

Setting the Stage: Historical Context

Locating the Site

1. Minuteman Missile Fields in The United States (Face to Face With the Bomb p.24)

2. 44th Missile Wing – Ellsworth Air Force Base (Nuclear Heartland pg. 56-57)

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1. The Cold War Escalates

2. Development of Intercontinental Ballistic Missiles and Deployment of Minuteman Missiles

3. Silent Soldiers: Missileer Duty

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3. Construction of Launch Control Center

4. Launch Control Facility Delta-01

5. Missileer in the Launch Control Center

6. Launch Facility Delta-09

Putting It All Together: Activities

1. The Minuteman: Part of our future or a relic of the past?

2. Intercontinental Ballistic Missiles: America's Cold War Deterrent

3. Nuclear and Cold War: A Shadow Over the World

About This Lesson

This lesson is based on the National Register of Historic Places registration file, "Minuteman Missile National Historic Site," *The Missile Plains: Frontline of America's Cold War, Historic Resource Study, Minuteman Missile National Historic Site*, and other associated primary sources dealing with the Cold War. The lesson is a collaborative effort produced by the Division of Interpretation at Minuteman Missile National Historic Site. This lesson is one in a series that brings the important stories of historic places into classrooms across the country.

Where it fits into the curriculum

Topics: The lesson can be used in American history, social studies and geography courses in units on modern American history, the Cold War, American foreign policy, 20th century military history or modern world history.
Time period: late 1950s to early 1990s
Relevant United States History Standards for Grades 5-12
Relevant Curriculum Standards for Social Studies

Objectives for students

1) To define and explain the Cold War
2) To compare and contrast the benefits of solid and liquid fuel ballistic missile systems
3) To evaluate how the Cold War influenced the development and deployment of the Minuteman Missile weapons system
4) To investigate the role and influence Missileers had as soldiers during the Cold War
5) To explore their own region for Cold War significant cultural resources

Materials for students

The materials listed below either can be used directly on the computer or can be printed out, photocopied, and distributed to students. The maps and images appear twice: in a smaller, low-resolution version with associated questions and alone in a larger version.
1) two maps showing post World War II geo-political situation, United States and Western South Dakota
2) three readings on the Cold War, Minuteman Missiles, life as a missileer, Ronald Reagan and the Berlin Wall
3) six photographs of various Cold War subjects and Minuteman Missile facilities

Visiting the Site

The Minuteman Missile National Historic Site consists of two detached facilities: Launch Control Facility, Delta-01 is off Exit 127 and Launch Facility, Delta-09 off Exit 116. Tours are offered daily throughout the year and begin at the park's project office located off Interstate 90 exit 131. For more information write the park at: Minuteman Missile National Historic Site, 21280 SD Hwy. 240, Philip, SD 57567 or call: 605-433-5552 or contact by email at mimi_information@nps.gov.

Getting Started

Inquiry Question


(U.S. Air Force)

What do think is happening in this picture?
Where do you think this picture was taken?

Teaching with Historic Places

Photo Analysis Worksheet

Step 1:
Examine the photograph for 10 seconds. How would you describe the photograph?

Step 2:
Divide the photograph into quadrants and study each section individually. What details--such as people, objects, activities--do you notice?

Step 3:
What other information--such as time period, location, season, reason photo was taken--can you gather from the photo?

Step 4:
How would you revise your first description of the photo

using the information noted in Steps 2 and 3?

Step 5:
What questions do you have about the photograph? How might you find answers to these questions?

Setting the Stage

Following World War II relations between the United States and Soviet Union spiraled downward. Each nation had emerged victorious from the war, but their ideological and economic systems were extreme opposites. The United States was based on a system of democracy and free enterprise. The Soviet Union employed a communist system ruled by a single political party. The Soviet government controlled every aspect of its citizen's lives. Following the war both nations had become involved in supporting allies whose form of government mirrored their own. Prominent leaders in the United States felt that the Soviets were supporting aggressive expansion of communism. The end result of this could possibly mean a world ruled by communism with the Soviet Union as its leader.
Both sides engaged in political, economic, cultural and most alarmingly military competitions.

At the end of the war the United States had led the world in development of new military weapons such as the atomic and hydrogen bombs. American technological expertise had kept it ahead in an escalating military competition with the Soviet Union. In the fall of 1957 though, the United States was jolted into stark reality. On October 4, 1957 the nation learned that the Soviets had gained a technological advantage with frightening speed. A Soviet satellite known as Sputnik had been the first of its kind ever launched into space. The physical presence of Sputnik seemed relatively innocent. After all, it was nothing more then an aluminum sphere, about the size of a beach ball which emitted a loud beeping noise. Yet American politicians, defense analysts and even ordinary citizens came to a logical conclusion: if the Soviets could use a rocket to launch Sputnik into space then it was just a matter of time before they used the same rocket technology to strike the heartland of America with a nuclear warhead. Suddenly every community in the United States was vulnerable.

A sort of psychological hysteria gripped the American mindset. Top scientists and military planners believed America had fallen far behind the Soviets in science and technology. Such scientific luminaries as Edward Teller, the physicist who had helped develop the hydrogen bomb, said that the United States had "lost a battle more important and greater then Pearl Harbor." Government reports called for a massive financial increase in the development of a US missile force. President Dwight Eisenhower responded by increasing funding for intercontinental ballistic missile development to record levels. Over the next few years the US was able to innovate and deploy a groundbreaking missile system across heartland of the United

States. This system known as the “Minuteman,” would give the US a decided military advantage over the Soviets for years to come.

Locating the Site

Map 1: Minuteman Missile Fields in the United States

Minuteman Missiles were deployed across the Central and Northern Great Plains region beginning in 1961. Minuteman Missiles were America’s first solid fuelled Intercontinental Ballistic Missiles (ICBMs). A ballistic missile is one that is launched by a motor which then cuts off. The rest of the missile’s flight is determined by the predominant forces of gravity and aerodynamic drag. These missiles were designed for delivery of nuclear weapons to a target thousands of miles away. By 1965 there were 1,000 Minuteman ICBMs located in six different missile fields. The military chose the Great Plains area to deploy these missiles for several reasons. The first Minuteman Missiles were deployed in the northern part of the country because their range was limited to 4,300 miles. The missile had to be launched over the North Pole in order to strike targets in the Central Soviet Union. Also, the Great Plains was the furthest area from both the Atlantic and Pacific coastlines. If missiles had been sited in states adjacent to the ocean they could have been destroyed by Soviet submarine launched ballistic missiles in a matter of minutes or even seconds. Other stated reasons for missile field location included closeness to existing Air Force bases for logistical support and cost effectiveness and low population density in the Great Plains meaning limited casualties in a nuclear war.

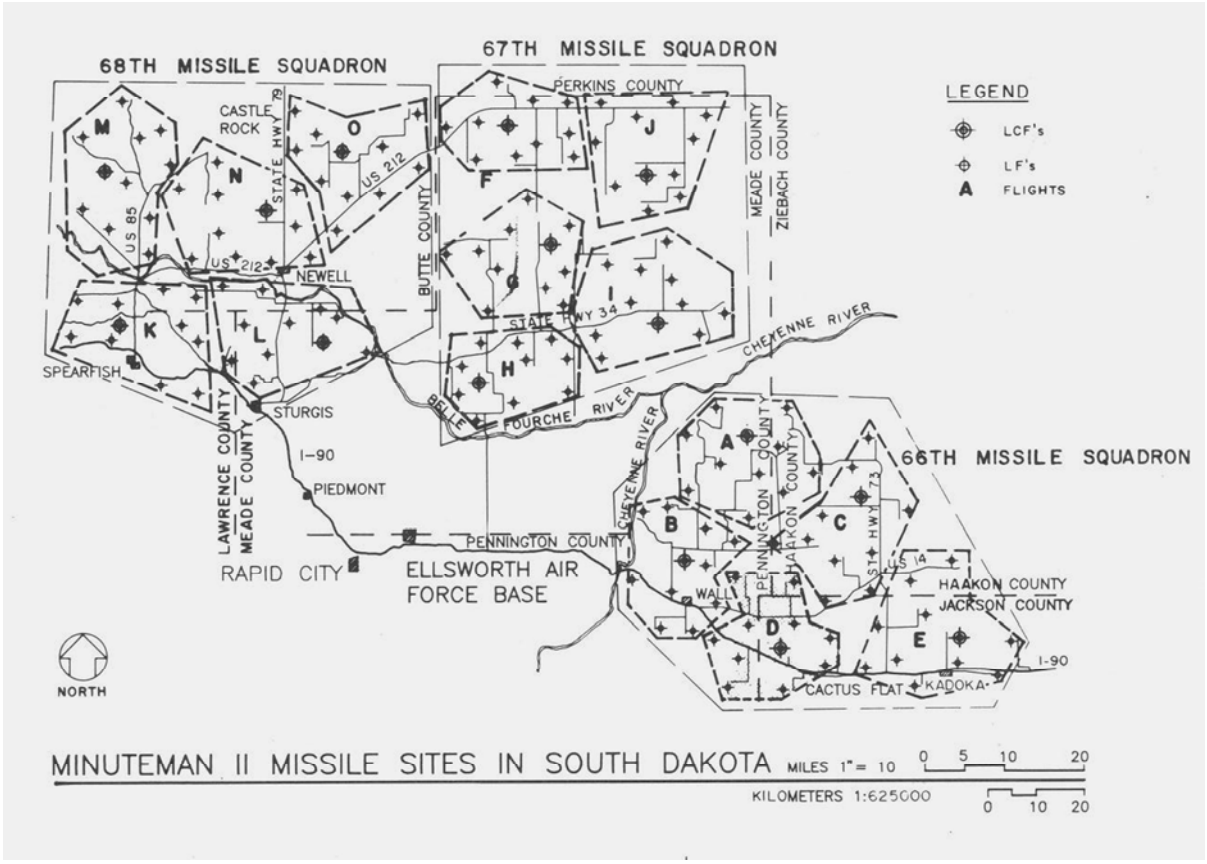
(Library of Congress)

Questions for Map 1

1. **Locate each of the six Air Force bases which had missile fields?**
2. **Why do you think missile fields were located within the middle of the United States? Why do you think the missile fields were not located closer to the Atlantic or Pacific coasts of the United States?**
3. **Based on the reasons listed above did the Great Plains seem like the best place to deploy missiles? Can you find a better area in the United States to locate them? Why or why not?**

Map 2: 44th Missile Wing, Ellsworth Air Force Base

The 44th Missile Wing at Ellsworth Air Force Base in Western South Dakota consisted of 150 Launch Facilities (silos) and 15 Launch Control Facility support structures (one for every ten silos). Each silo held one Minuteman Missile. The silos were unmanned, independent and dispersed across the high plains. The Air Force required that no silo be within three and a half miles of another. This was done so a ten megaton explosion at the nearest facility would not destroy an adjacent facility. An underground network of communication cables interconnected the silos and support structures. A flight was made up of ten missiles (i.e. support structure Delta-01 was in command of silos Delta-02 through Delta-11). Each flight of ten missiles was part of a squadron of fifty missiles. The ten missiles of Delta flight were joined by the Alpha, Bravo, Charlie and Echo flights to make up the 66th missile squadron. There were three squadrons of fifty missiles in Western South Dakota making up the entire 44th missile wing of 150 missiles. The missile field in South Dakota covered a vast region of approximately 13,500 square miles (an area larger then the state of Maryland).



(Library of Congress)

Questions for Map 2

1. **Locate Ellsworth Air Force Base. What is the distance to the furthest Launch Control Facility from the base? If you drove 60 miles an hour how long would it take to get from the base to this LCF?**
2. **Locate the Delta missile flight (hint: the map shows each flight by the first letter in its name)? Describe its location within the missile field?**
3. **Based on the information given above why do think it was better to have the sites spaced apart? Can you think of a better way to organize the missile field?**

Determining the Facts

Reading 1: The Cold War Escalates

In the 12 years following the end of World War II, the United States and Soviet Union had been locked in what would become known as the Cold War. The Cold War would be quite different from other wars that have occurred throughout history. Most wars had been "hot" or "shooting wars," where the opponents fought battles using weapons which caused destruction and loss of life. Conversely, the Cold War was a struggle between the United States and Soviets to decide which of their economic and ideological systems would govern world affairs. The United States system was based on democratic government and an economic system of free enterprise. The Soviet Union was based on communism. Communism is a system where a single authoritarian party owns all property within the nation and controls all production. Goods and services are then distributed to the people by the state. These democratic and communist systems were directly opposed to one another and engaged in competition around the world. Each time the United States would seemingly gain an advantage such as the atomic bomb, the Soviets would follow suit by mimicking the American breakthrough.

Containing the spread of communism in nations of both Western Europe and Asia was the main focus of American foreign policy efforts. American political and military leaders had become increasingly convinced that only a show of force would keep communist aggression from trying to control the world. Battlegrounds had included the divided city of Berlin split between East and West Germany and the Korean peninsula. By the mid 1950s many Americans wondered if it was just a matter of time before the Cold War would escalate into a hot or shooting war with the Soviets. Of course, since the United States had enjoyed a lead in developing scientific and military technologies the nation still felt confident it would eventually emerge victorious in this tense conflict. That illusion was shattered with the Soviet launch of the satellite Sputnik on October 4, 1957. A communist system once defined by economic and technological backwardness had been able to develop technologies which could not only threaten America's influence around the world, but also its own heartland. American fears were compounded by statements from Soviet premier Nikita Khrushchev that the communists would soon be mass producing missiles. Americans began to ask the inevitable question: How could the United States regain their advantage?

At this point the hopes and fears of Americans invested themselves in President Dwight Eisenhower. Eisenhower had gained a status nearly above politics by his second term in office. He had led the country to victory in World War II and overseen a period of great prosperity during his first five years in office. If anyone could quiet the growing crisis of confidence in the American system it would be the leader fondly nicknamed, "Ike." Eisenhower had long warned the nation about the

consequences of a vast military build-up. Sure it was important for national security, but forty percent of the national budget already went for military expenditures. Competing with the Soviets by further increasing the military budget had more then just financial costs. At some point Eisenhower believed the economy could become so tied to military spending that it could threaten America's democratic values. Then the United States would become no different from the communists it was supposed to be fighting. Eisenhower began to fast track the development of ballistic missiles because they had the possibility of being cost effective. A missile force could threaten the Soviets with destruction if they were to ever attack the United States while at the same time costing much less then other forms of military buildup. In other words, missiles would offer more bang for the buck.

In late 1957 the pressure on Eisenhower was immense. Americans were near hysteria over Sputnik and expected solutions immediately. Their growing displeasure increased after the failed launch of America's first satellite, VanguardTV3. Americans watched the nationally televised event with horror on December 6, 1957 as the rocket rose a mere four feet off the pad, fell back to the ground and exploded in flames. The national shame was complete. Into this situation Eisenhower stepped before Congress and the nation on January 9, 1958. In this speech he attempted to quiet the nation's concern and outlined American missile efforts that would eventually exceed Soviet efforts:

"Now as to the period ahead: Every part of our military establishment must and will be equipped to do its defensive job with the most modern weapons and methods. But it is particularly important to our planning that we make a candid estimate of the effect of long-range ballistic missiles on the present deterrent power I have described.

At this moment, the consensus of opinion is that we are probably somewhat behind the Soviets in some areas of long-range ballistic missile development. But it is my conviction, based on close study of all relevant intelligence, that if we make the necessary effort, we will have the missiles, in the needed quantity and in time, to sustain and strengthen the deterrent power of our increasingly efficient bombers. One encouraging fact evidencing this ability is the rate of progress we have achieved since we began to concentrate on these missiles.

The intermediate ballistic missiles, Thor and Jupiter, have already been ordered into production. The parallel progress in the intercontinental ballistic missile effort will be advanced by our plans for acceleration. The development of the submarine-based Polaris missile system has progressed so well that its future procurement schedules are being moved forward markedly.

When it is remembered that our country has concentrated on the development of ballistic missiles for only about a third as long as the Soviets, these achievements show a rate of progress that speaks for itself."[2]

Action was taken following Eisenhower's address. Congress passed legislation that began a series of programs to boost American technology. An emphasis on educational incentives and programs would lead to an increase of engineers. Financial support for scientific research tripled over the next year. Development of the Polaris submarine based missile program was pushed to the forefront of naval operations. Finally, Intercontinental Ballistic Missile Programs had their budgets increased. In just a few years the United States would be ready to deploy the first solid-fuelled ICBM, the Minuteman. This missile would be one of the greatest technological breakthroughs in American history. The United States would regain the lead in the Cold War and keep it over the next three decades.

Questions for Reading 1

1. Define the Cold War? How was it different from other "hot" or shooting wars?

2. Why did the launch of Sputnik cause Americans to fear for their own security?

3. Why do you think President Eisenhower worried about increasing military expenditures?

4. What actions and programs did President Eisenhower mention in his State of the Union that the United States was taking to regain their military advantage over the Soviets?

5. Why were Intercontinental Ballistic Missiles so important to national defense?

Reading 1 was compiled from The Missile Plains: Frontline of America's Cold War Historic Resource Study Minuteman Missile National Historic Site, South Dakota *(Omaha: Mead & Hunt Inc., 2003)*; *Downing, Taylor and Issacs, Jeremy*, The Cold War: An Illustrated History 1945-1991. *(Little, Brown and Company: Boston, 1998)*

Reading 2: Development of Intercontinental Ballistic Missiles and Deployment of the Minuteman

To understand why the Minuteman Missile was such an astounding innovation it is vital to first learn about the missile systems which preceded it. At first the Soviets were able to outperform the United States due to the massive amount of time, energy and monetary resources they put into their program. By 1957 Soviet efforts had resulted in the world's first intercontinental ballistic missile, the R-7 Semyorka. The R-7 missile relied on liquid fuel and four strap-on booster

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[2] *State of the Union Address, President Dwight D. Eisenhower, U.S. Congress, January 9, 1958,*

rockets to propel the vehicle after its initial launch. Though the R-7 was considered a great innovation it was burdened by outrageous costs and other inefficiencies. For instance, large launch sites had to be constructed in extremely remote areas. These sites cost up to five percent of the Soviet defense budget. The R-7 also took twenty hours of preparation for a single launch. American bombers would have more then enough time to destroy the rocket while it sat on the launch pad. Nonetheless, it seemed to Americans that the Soviets had once again taken the technological lead.

Unknown by many Americans had been a behind the scenes effort to develop an even better missile system. The Air Force had been slow to grasp the military capabilities of missiles. The upper echelon leadership was dominated by former fighter pilots who saw missiles as a threat to their own interests. Only after missile development by the Army and Navy began to outpace their own, did the Air Force leadership suddenly speed up their own program. Leading the way was a special branch known as the Air Research and Development Command (ARDC) which was to oversee the new missile program. They contracted with a corporation known as Convair to develop a ballistic missile. This weapon was to carry a nuclear warhead to 300 yards of a target 5,000 miles away. It became known as the Atlas. The program had been accelerated by President Eisenhower after he had taken office in 1953. It was believed that the program would take around six years to produce a workable missile.

The main problem with liquid fuel systems was the danger caused by the highly flammable fuel. This fuel was not inserted until just before a launch thus it had to be stored safely until that very moment. The slightest spark could cause an explosion which then might endanger the lives of on-site crews and destroy the entire launch facility. Another problem was the heavy weight of the fuel which meant the rocket could have trouble getting off the ground. The first Atlas was gigantic, weighing 267,000 pounds. This weight was mainly due to the heavy fuel and massive engines which gave the rocket enough thrust to propel it into flight. By 1958 an Atlas had been successfully tested and by the next year several were placed in the first active missile fields. Yet the Air Force was not totally satisfied with the Atlas system. The liquid fuel caused several accidents. In addition, the time taken to pump the fuel into the rocket meant that at the very least it would be fifteen minutes before lift off. The Soviets were developing submarine launched ballistic missiles which when fired from just off the Atlantic or Pacific coasts could destroy Atlas missiles before they were ready for launch. Fortunately the Air Force had been working on a new top secret missile program which would solve many of these problems literally overnight. It involved a concept known as solid fuel and an innovative weapon which came to be known as the Minuteman.

During the mid-50s solid fuel missiles were already being developed in the hope that they could replace their dangerous liquid fueled predecessors. Solid fuel had a number of advantages including safety, cost effectiveness and reliability. In 1958 the Air Force approved a design for a solid fueled missile. This missile was the brainchild of Lieutenant Colonel Edward Hall. Hall almost single handedly assimilated the knowledge from existing studies and technologies to innovate a new design. The missile designed was a vast improvement. With solid fuel technology it would be able to lie dormant for long periods of time with limited maintenance and

upkeep. The cost of production would be about one-fifth the cost of an Atlas. Most importantly, it had the ability to be remotely controlled as a hair trigger response. Within minutes of receiving a launch command it could be airborne to strike targets in the Central Soviet Union. Hall named it the "Minuteman" because of this quick strike ability. As an added bonus the Soviets were far behind in developing solid fuel rockets.

Both American politicians and military planners wanted the Minuteman operational and in the field as soon as possible because of a perceived "missile gap" with the Soviets. Less then three weeks after the launch of Sputnik in late 1957 a panel had told the director of the Central Intelligence Agency (CIA) that the Soviets would be mass producing missiles by decade's end. Conversely, the United States would be hard pressed to even deploy a workable system with a few missiles. The "missile gap" referred to the greater amount of missiles it was believed the Soviets had in comparison to the United States missile force. In the presidential election of 1960, Democratic candidate John F. Kennedy campaigned on this idea and the devastating consequences it would have for the country. Kennedy eventually defeated Eisenhower's vice president Richard Nixon in part because of the belief in a "missile gap." Though the "missile gap" would eventually be proven false, public perception and political pressure resulted in the activation schedule for the Minuteman being moved forward. The Minuteman had been set for operational use by 1963, but a monumental effort by the Air Force and its contracting partners resulted in the first missile field activated on October 24th, 1962 at Malmstrom Air Force Base in Montana.

The first Minuteman's went on alert at the height of the Cuban Missile Crisis. This crisis was brought about by the Soviet's attempting to deploy missiles in Cuba. Historically Cuba had been an ally of the United States for decades, but in the late 1950s a revolution had led to a communist government taking control of the country. Americans could feel communism literally knocking at the nation's back door. Cuba was less then 100 miles from the southern mainland of the United States. This could have resulted in strikes against the southern United States with only perhaps a minute of warning. President Kennedy issued orders for a naval quarantine of Cuba, whereby Soviet ships would not be allowed to pass through with vital military supplies. The quarantine was really a blockade that could have been interpreted by the Soviets as a declaration of war. Fortunately for both sides cooler heads prevailed. The Soviets decided not to challenge such a show of force and a negotiated settlement was reached. The Soviets agreed to remove all of their missile installations in Cuba. For their part, the United States also agreed to dismantle missiles they had installed on the Soviet border in Turkey. The world had barely escaped an apocalyptic nuclear war. The United States continued to fear for its security, but had realized that the Minuteman weapons system had been a valuable asset during the crisis. President Kennedy had referred to it as his "Ace in the Hole." Over the next two years hundreds of Minuteman Missile silos and support structures would be constructed across the Great Plains landscape, including the state of South Dakota.

Questions for Reading 2

1. **What were some of the drawbacks of liquid fuel missile systems? What the benefits of solid fuel systems? Compare the two.**

2. **Do think Atlas missiles could have been deployed in large numbers? Why or why not?**

3. **Why did the "missile gap" play such a large role in the accelerated development and deployment of the Minuteman?**

4. **What kind of impact do you think the Cuban Missile Crisis had upon the Minuteman program?**

Reading 2 was compiled from *Kort, Michael*, The Columbia Guide to the Cold War. The Columbia Guides to American History and Cultures Series. *(New York: Columbia University Press, 1998);* .Special Resource Study for Minuteman Missile Sites: Management Alternatives and Environmental Assessment. Washington, D.C.: Department of the Interior, Department of Defense and the U.S. Air Force Legacy Resource Management Program *(Denver: National Park Service, 1995)*; The Missile Plains: Frontline of America's Cold War Historic Resource Study Minuteman Missile National Historic Site, South Dakota *(Omaha: Mead & Hunt Inc., 2003).*

Reading 3: Silent Soldiers: Missileer Duty

By the fall of 1963 there were 150 Minuteman Missile Launch Facilities (silos) dispersed across Western South Dakota. For every ten silos there was a support structure known as a Launch Control Facility (LCF). This building had a facility manager, cook and several security police who were stationed on the topside to provide support for two missileers stationed in a Launch Control Center (LCC) capsule below the surface. These topside personnel worked for three straight days followed by another three days off. The missileers in the underground Launch Control Center were on duty for 24 straight hours before they would go back to base and eventually home. About eighty miles east of Rapid City, South Dakota and Ellsworth Air Force Base was Launch Control Facility Delta-01. This LCF was operational for nearly thirty years. The Air Force personnel on duty here experienced some of the tensest moments during the Cold War. Though they were not on the front lines of international incidents which occurred around the world, they were on the frontlines of America's Cold War defenses. These were the forgotten soldiers who performed alert shifts year after year.

Of all the duties performed by Air Force personnel at Delta-01 there was none more important then that of the missile combat crew which occupied the LCC. The crew consisted of a commander and deputy who were both officers. This particular capsule, buried thirty-one feet below the surface, was both their living and work area for an entire twenty-four shift. The missileers underwent intense training for several months before they were allowed to go on duty in an active missile field. Not only were they expected to learn a mind boggling amount of technical data about the Minuteman system, but they also had to be psychologically stable. There jobs could possibly be one of the most stressful in the Air Force. Once

they were properly trained and on alert they were expected to be no less then perfect at their jobs.

A typical day for a launch crew stationed at Delta-01 would start early in the morning when they arrived at Ellsworth. They would first undergo a security briefing about the international situation around the world. It was during this briefing that they would be informed if there was any reason that the base might be placed on higher alert status. They would then drive an official Air Force vehicle out to the LCF. Usually the drive to Delta-01 would take about an hour and a half. Once they arrived at the security fence surrounding the LCF they would radio in their dispatch information to the Flight Security Controller who monitored the grounds from the Security Control Center. This information was checked for accuracy then the gate would be opened by remote control. The missileers would pull up to a door adjacent to the Security Control Center to have their identification checked. Once they had been properly identified they would be allowed into the building. The missileers would then call down to the offgoing missile crew already on duty in the underground capsule to authenticate secret codes. They must have the correct codes or it would mean a trip all the way back to base for another set of codes.

From the Security Control Center they would then be allowed entry into the elevator leading down to the capsule. When they arrived underground the deputy crew member already in the capsule would open the eight ton blast door to allow them entry. This door was to be kept shut at all times unless someone had the proper authentication codes to enter the capsule. When passing by the door they would see painted on the wall: No Lone Zone, Two Man Concept Mandatory. This meant that no one could ever be in the capsule alone. All areas of extremely high security in the missile field adhered to the two man concept. Being in such an area alone would result in the loss of one's job.

The offgoing missile crew always gave the new crew a short ten minute briefing which consisted of among other things the handing over of two .38 revolvers for use if any intruders entered the capsule. The crew going off duty would then exit the capsule and the new crew's shift would officially begin. Former missileer Andy Knight recalled years later what a typical alert was like:

"Ninety percent or ninety-five percent of the time, usually we'd just sit there. We would read magazines. Study for the professional military programs, or some people would work on their master's degree. It was a great time, at that time. And at that time they didn't allow any kind of t.v. sets or anything like that down there. It was just the crew. And, as I said before, there was one cot there and one crew member could go to sleep. And usually the person who had the graveyard shift--the midnight to six o'clock in the morning shift--usually that person would crawl into the cot right after dinner. Usually we'd have dinner right around five o'clock, so that person'd get in the cot and go to sleep from five, and then from five until about midnight. And then the deputy, at midnight then we'd swap off. And, you'd get into, it was like a hot bunk and you'd sleep until about six o'clock in the morning. That was generally what took our tour."[3]

Even though many alert duties were spent passing time, the missileers knew from their training that there jobs were of the utmost importance. As Knight recalled:

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[3] *Knight, Andy*, Interview by Dr. Steven Bucklin. Typed transcript. *May 19, 1999, 17-18.*

"it was probably the most, most responsibility that I've ever had in my life. And, we were tested constantly. And, the tests that we were, whether it was, whether it was multiple choice or written exams. Or whether it was actual training scenarios in the simulator, we always had on the written exams one hundred percent was passing, if you missed one question, you failed, and you had to start all over again. So there was no room for error."[4]

During their alert shift the missileers received coded messages from Strategic Air Command (SAC) in Nebraska. Though the crew may have been stationed at Ellsworth they took their orders from SAC. The most important and feared command they could ever receive was known as an Emergency War Order (EWO). This order would mean the missiles were to be launched. The following description is a detailed account of executing such an order:

"In the Delta One capsule, an alarm would have alerted the two-person missile crew of those directives. Immediately, over the speaker system, the launch control officers would hear a coded message, giving the command to launch. After verifying the message's authenticity, the launch officers would unlock a small, red, "Emergency War Order" safe above the deputy commander's control panel. Within the box were two launch keys. Each officer would take one key, and insert it into his or her control console. The missileers would then strap themselves into their console chairs and begin the final countdown.

At the end of the countdown sequence, the officers would turn their launch keys. The Air Force employed several fail-safes to prevent an unauthorized missile launch. For example, both officers had to turn their launch keys in unison. Because the launch switches were 12 feet apart, it was impossible for one person to turn both keys at once. The final command to launch also required another "vote"(two missileers performing the same procedure at another Launch Control Center in the missile field) from outside of Delta One.

When the second vote came in, the LAUNCH IN PROCESS display would illuminate. Explosive gas generators would then push open the 90-ton launch doors covering the ten Delta Flight missile silos, and the nuclear-tipped Minutemen would begin streaking toward their targets half a world away. As each missile blasted from its silo, its upper umbilical cable would sever, triggering the MISSILE AWAY light on the commander's control panel.

In less than five minutes, the Delta One missileers would have completed their mission. The Minuteman missiles would take another half hour to reach their targets."[5]

Though missileers never executed an actual launch there was always the distinct possibility that such a moment could come. As the Emergency War Order proceedings illustrate the missileers had one of the toughest jobs in the Air Force.

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[4] *Knight,* 5.

[5] *Special Resource Study for Minuteman Missile Sites: Management Alternatives and Environmental Assessment, 51.*

For nearly thirty years at Delta-01 they pulled hundreds of alerts awaiting orders which fortunately never arrived. These silent soldiers went relatively unnoticed by the general public or even their own fellow Air Force personnel. While other officers such as fighter pilots and generals received admiration and public glory the missileers performed one of the most valuable duties. They protected America from armed aggressors thousands of miles from home and the end result was a valuable contribution to victory in the Cold War.

In 1991, less then two years after the Berlin Wall fell the Soviet Union began to crumble. The Soviet economy had been faltering for years. The cost of keeping up with advanced American military weapons systems such as the Minuteman had led the Soviet economy to the brink of bankruptcy. The nation's infrastructure began to fall apart. For decades, the Soviets had barely been able to take care of its military needs, but this came at the expense of their citizen's standard of living. By the beginning of the 1990s the Soviet people began to grow increasingly restless as they saw democracy and free enterprise economics take hold in the nations of Eastern Europe that had once professed their loyalty to communism. In a remarkable series of events which included street protests, rallies and the attempted overthrow of leader Mikhail Gorbachev the Soviet Union finally dissolved in December of 1991. The Cold War had finally ended with world civilization intact. The Minuteman Missiles in South Dakota quickly became slated for deactivation. These missiles which had acted as silent sentinels guarding the United States for nearly three decades had completed their mission.

Questions for Reading 3

1. **Why would the missile combat crew have the most stressful job at Delta-01? Who do you think had the least stressful?**

2. **Describe what you think the primary mission of a missileers duty is?**

3. **Why do think there were so many security procedures for missileers? Do you think other jobs in the Air Force require secret codes and high security?**

4. **What role do you think Missileers played in both protecting the Citizens of the United States from nuclear attack and helping the nation eventually win the Cold War?**

5. **Why do you think Missileers did not receive the glory and accolades that other military personnel have?**

Reading 3 was compiled from *Knight, Andy*, Interview by Dr. Steven Bucklin. Typed transcript. *May 19, 1999; Manson, Craig*, Interview by Sue Lamie. Typed transcript. *June 27, 2002*; Special Resource Study for Minuteman Missile Sites: Management Alternatives and Environmental Assessment. Washington, D.C.: Department of the Interior, Department of Defense and the U.S. Air Force Legacy Resource Management Program *(Denver: National Park Service, 1995)*; The Missile Plains: Frontline of America's Cold War Historic Resource Study Minuteman Missile National Historic Site, South Dakota *(Omaha: Mead & Hunt Inc., 2003*).

Visual Evidence

Photo 1: Sputnik

(NASA)

It was this seemingly odd looking sphere which would eventually lead the United States to accelerate their ballistic rocket program. Sputnik meant "fellow traveler." It was the first of many Soviet launched satellites. More importantly this beach ball sized object showed the world that the Soviet's reigned supreme in their missile technologies. It was not really the Sputnik satellite which worried the United States instead it was the R-7 launch vehicle which propelled it into space. How long would it would be until the R-7 brought a nuclear bomb to the American mainland? After Sputnik it seemed just a matter of time.

Questions for Photo 1

1. **Describe the size, shape and other notable physical details of Sputnik? Does it look like a technological wonder?**

2. **How do you think this photo was taken? Does it look real? Why or why not?**

3. **Do think Americans had reason to be scared of Sputnik? Would its successful launch have scared you?**

(U.S. Air Force, History Division)

Photo 2: President Kennedy with Strategic Air Commander General Thomas S. Power at Vandenburg Air Force Base

Vandenburg Air Force Base in California was the main testing/training base for Minuteman Missiles and their operations. President John F. Kennedy visited the base during the early 1960s to show his support for the Minuteman program. It was during Kennedy's term as president that the Minuteman became the United States leading nuclear missile force. He referred to it as his "Ace in the Hole."

1. **Why do you think presidential support was vital to the Minuteman program?**

2. **What do think President Kennedy meant by his quote that the Minuteman was his "Ace in the Hole?"**

(Library of Congress)

Photos 3 & 4: Launch Control Center

Construction crews came to Western South Dakota to take part in an unprecedented effort to build the facilities needed to support 150 Minuteman Missiles. One of the most important structures was this egg shaped capsule. Inside of this capsule was a box known as the Launch Control Center (LCC). It was from within this structure that missileers would be in direct control of ten Minuteman Missiles. They could launch these missiles in the event of a Soviet pre-emptive nuclear strike. The capsule at Delta-01 was buried 31 feet below the surface and surrounded by reinforced concrete. The LCC needed this protection to survive a nearby nuclear blast. A pair of missileers (commander and deputy) worked within the capsule. Missileers worked an average of eight twenty four shifts per month. There were always two in the Launch Control Center at a time. They performed such diverse technical duties as monitoring maintenance of silos or silo security alarms, running endless tests and decoding messages from headquarters.

Questions for Photos 3 & 4

1. **What do you notice about the site from this photo? Describe the surrounding landscape. Does the capsule fit in with its immediate surroundings?**

2. **Would you fill safe inside of the capsule? What about when it was fully buried? Do you think a buried Launch Control Center could withstand a direct Soviet missile hit?**

3. **How would you describe the Launch Control Center? Does it look like a difficult place to work?**

4. **What would you do in your spare time if you worked in the Launch Control Center? Do you think the twenty four hour shift would go by quite fast or very slowly?**


(NPS)

Photo 5: Launch Control Facility Delta-01

The Delta-01 Launch Control Facility was one of fifteen constructed in the missile field of Western South Dakota. These buildings offered topside support for the two missileers stationed in the capsule beneath the surface. The Delta-01 structure was neither hidden nor advertised. Instead it was of basic ranch design, made to look the same as many structures in this region of South Dakota. Many of the implements which gave away Delta-01's military mission were stationed around the building. These included a surrounding chain link fence, an array of bizarre antennas and a helicopter landing pad.

Questions for Photo 5

1. **What kind of building does this look like to you? Would you think that it controlled nuclear missiles?**

2. **How do think the Air Force personnel liked living and working at Delta-01? Does it look like a nice comfortable environment, a serious one?**

3. Why do think the Launch Control Center was beneath the surface instead of placed on the topside beside the rest of the Launch Control Facility?

(National Park Service)

Photo 6: Launch Facility Delta-09 Today

Dispersed across the high plains of South Dakota were 150 silos just like the Launch Facility at Delta-09. Delta-09 connected to its Launch Control Facility at Delta-01by underground communications cables. Nearly all of the time Delta-09 was unmanned. Periodically maintenance crews would arrive to perform upkeep or take

care of any malfunctioning systems. At other times security police would have to secure the site if any outer or inner zone alarms sounded. Below the circular ninety ton concrete cap was a Minuteman II missile. This missile was housed in a silo which was temperature and humidity controlled. The Minuteman carried a 1.2 megaton warhead which had 120 times the explosive capacity of the atomic bomb dropped on Hiroshima during World War II.
Today visitors to Minuteman Missile can take tours of both Delta-09 (shown above) and Delta-01 the Launch Control Facility. Minuteman Missile National Historic Site was established in 1999 by the United States Congress. The park's resources are the only National Park unit specifically designated to illustrate the history of the Cold War, the nuclear arms race and development of ICBMs. Tours are given daily, offering visitors a unique window into the long and troubled conflict known as the Cold War.

Questions for Photo 6

1. **Does the launch facility look dangerous? Do any of the above ground structures indicate a nuclear missile is beneath the concrete cap?**

2. **What would you think Delta-09 was if you did not know that it was a Launch Facility?**

Putting It All Together

In this lesson, students learn how the escalation of the Cold War led to the development of Intercontinental Ballistic Missiles and the deployment of the Minuteman Missile system. The following activities will help students apply what they have learned.

Activity 1: The Minuteman: Part of our future or a relic of the past?
Have students do research on current Minuteman Missile locations in the United States. Subjects to research include: why Minuteman's were deployed in specific areas, the existing missile field locations and the Minuteman's role in the United States national defense today. Then divide students into two groups for the following activity. One can be a group of politicians wanting to deactivate the missiles while the other can be Air Force officers who want to keep the Minuteman. It is time to decide whether the Minuteman Missile has become obsolete and should be replaced by more "advanced" weapons systems. Divide the students into two groups, have one argue in support of keeping the missile fields and the other must give reasons why the missile fields are no longer needed.

Activity 2: Intercontinental Ballistic Missiles: America's Cold War Deterrent
Divide students into four groups and assign each group one of America's ground based missile forces during the Cold War: the Atlas, Titan, Minuteman and

Peacekeeper. Have the students research each missile's specifications such as height, weight, range, and warhead size plus the pros and cons of each specific one. In addition, have each group make a large design drawing of their missile. Have them present this information to the class, then ask the students to vote which of these missiles was the best for United States defensive capabilities.

Activity 3: Nuclear and Cold War: A Shadow Over the World
Divide students into four different groups to interview their parents or community members about the Cold War. Each group should concentrate on getting the answers to one of the following four questions: a. what did they think would happen during the Cuban Missile Crisis, b. were their other times during the Cold War that they worried about a nuclear war, c. did they believe a nuclear war was survivable, d. what is their most memorable personal experience of the Cold War era. After the interviews are completed have each group report their findings back to the class. Then lead the students in discussion of each of the four questions asking to give them to give their personal opinions of each situation.

Minuteman Missile National Historic Site: Legacy of the Cold War – Supplementary Resources

By looking at the historic resources of Minuteman Missile National Historic Site students learn about the Cold War and the vital part played by the weapons system during the conflict. The following is a list of websites where students will find excellent research materials and information related to the Cold War and Minuteman Missiles:

Minuteman Missile National Historic Site
www.nps.gov/mimi - the park website has several historic studies that place the Minuteman weapons system in its proper historic context.

Strategic Air Command
http://www.strategic-air-command.com – Strategic Air Command was the branch of the Air Force in overall command and control of all Minuteman missiles.

CNN Cold War
http://www.cnn.com/SPECIALS/cold.war - the major news network CNN did a fabulous documentary series on the Cold War, this website contains excellent resources.

The Cold War Museum
http://www.coldwar.org – online museum with detailed timeline and explanation of major events that occurred during the Cold War. Also, includes fascinating historical accounts of military and espionage activities.

Cold War Files
www.coldwarfiles.org – an online classroom filled with resources for high schools students, developed by the Cold War International History project.